

Amendments to the Drawings:

The attached sheets of drawings include Figures 1-4 as originally filed in PCT/EP205/051478, which forms the basis for this Section 371 application.

Attachment: New Sheets of Drawing

REMARKS

The present Amendment is in response to the Examiner's Office Action mailed August 6, 2007. Claims 1-10, 14, and 19 are cancelled, claims 11, 17, 18, and 20-24 are amended, and new claims 29 and 30 are added. Claims 11-13, 15-18, and 20-30 are now pending in view of the above amendments.

Reconsideration of the application is respectfully requested in view of the above amendments to the claims and the following remarks. For the Examiner's convenience and reference, Applicant's remarks are presented in the order in which the corresponding issues were raised in the Office Action.

Please note that the following remarks are not intended to be an exhaustive enumeration of the distinctions between any cited references and the claimed invention. Rather, the distinctions identified and discussed below are presented solely by way of example to illustrate some of the differences between the claimed invention and the cited references. In addition, Applicants request that the Examiner carefully review any references discussed below to ensure that Applicants understanding and discussion of the references, if any, is consistent with the Examiner's understanding.

I. Amendment To The Specification

The Examiner objects to the specification because an abstract is not present. In response, Applicant's have amended the specification to include an Abstract. Therefore, the Applicant respectfully requests that the objection to the specification be withdrawn.

II. Amended Drawings

The Examiner objects to the drawings because the drawings were not submitted during nationalization of the international application. In response, the Applicant submits herewith the drawings, a true and complete copy of which is submitted.

III. Rejection Under 35 U.S.C. § 112, Second Paragraph

The Examiner rejects claims 21-24 under 35 U.S.C. 112 because claim 21 includes the element "a third spectral filter" without reciting a second spectral filter. Claims 22-24 are

rejected because they depend from claim 21. Claim 21 has been amended to remove the adjective “third”. Claims 22-24 have been consistently amended. Therefore, claim 21 is definite and the Applicant respectfully requests that the rejection of claims 21-24 be withdrawn.

IV. Allowed Subject Matter

The Examiner has indicated that claims 17 and 18 would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. In response, Applicants have rewritten claims 17 and 18 in independent format so as to include all of the limitations of the base claim from which each claim depends. In particular, the scope of claims 17 and 18 have not been narrowed in any way so as to overcome any prior art, but have merely been rewritten in an independent format. As acknowledged by the Examiner, those claims are patentably distinct from the prior art, and are now in a condition for allowance.

IV PRIOR ART REJECTIONS

A. Rejection Under 35 U.S.C. §102(b)

The Examiner rejects claims 11-13 under 35 U.S.C. §102(a) as being anticipated by *Falk et al.* (United States Patent No. 4,611,712). Because *Falk* does not teach or suggest each and every element of the rejected claims, Applicants respectfully traverse this rejection in view of the following remarks.

A claim is anticipated under 35 U.S.C. § 102(a) only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. Further, the identical invention must be shown in as complete detail as is contained in the claim. Finally, the elements must be arranged as required by the claim. *Manual of Patent Examining Procedure (“MPEP”) § 2131.*

Claim 11 has been amended to include the elements, “at least one spatial filter component, the spatial filter component being formed and arranged so that the angular range of reception of the reflected radiation is limited; and a first spectral filter component located upstream of the spatial filter component in the receiving direction and reflecting in the infrared range for screening background radiation and for avoiding or reducing heating-up of the distance

meter.” (Emphasis added). Such elements are disclosed at least on page 2, lines 22 to 25 (“For suppressing or screening the background radiation, a multi-stage filtration concept with spectral broadband, narrowband or local or spatial filters is used.”) and on page 7, lines 19-24 (“By the cooperation of the components, the incident radiation S is separated with respect to its spectral and direction components, a major part of the radiation being reflected in order to avoid or at least to reduce heating-up of the distance metre.”) of the Applicants specification.

The Applicant respectfully requests that the rejection of claim 11 be withdrawn as *Falk* fails to explicitly or inherently teach both of these elements of claim 11. For example, as *Falk* does not teach a screening effect of the filters disclosed therein, *Faulk* also does not discuss avoiding or reducing heating-up of a distance meter. As such, the Applicant respectfully requests that the rejection of claim 11 be withdrawn.

Claims 12-13 depend from claim 11. Therefore, the Applicant respectfully requests that the rejections of claims 12-13 be withdrawn for at least the same reasons as claim 11.

B. Rejection Under 35 U.S.C. § 103

The Examiner rejects claim 14 under 35 U.S.C. § 103 as being unpatentable over *Falk* in view of *Morley* (U.S. Patent No. 5,039,96). The Examiner rejects claim 15 under 35 U.S.C. § 103 as being unpatentable over *Falk* in view of *Ibsen et al.* (U.S. Pub. 2000/0067645). The Examiner rejects claim 16 under 35 U.S.C. § 103 as being unpatentable over *Falk* in view of *Martinsson* (U.S. Pub. 2004/0213527). The Examiner rejects claims 19 and 25 under 35 U.S.C. § 103 as being unpatentable over *Falk* in view of *Sauter* (U.S. Patent 6,111,692). The Examiner rejects claim 20 under 35 U.S.C. § 103 as being unpatentable over *Falk* in view of *Sauter*, further in view of *Abe* (U.S. Pub. 2004/024695). The Examiner rejects claim 21 under 35 U.S.C. § 103 as being unpatentable over *Falk* in view of *Sauter*, further in view of *Billmers et al* (U.S. Patent No. 6,724,467). The Examiner rejects claim 22 under 35 U.S.C. § 103 as being unpatentable over *Falk* in view of *Sauter* and *Billmers*, further in view of *Juppet et al.* (U.S. Pub. 2004/0130702). The Examiner rejects claims 23 and 24 under 35 U.S.C. § 103 as being unpatentable over *Falk* in view of *Sauter* and *Billmers*, further in view of *Popescu et al.* (U.S. Patent 6,181,412). The Examiner rejects claims 26-28 under 35 U.S.C. § 103 as being unpatentable over *Falk* in view of *Sauter*, further in view of *Noriaki et al* (“Improvement of

Laser-Beam Irradiation-Intensity Distribution Using Multi Lens Array and Edge-Shaped Plates” (1998)).

According to the applicable statute, a claimed invention is unpatentable for obviousness if the differences between it and the prior art “are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art.” 35 U.S.C. § 103(a) (2005); *Graham v. John Deere Co.*, 383 U.S. 1, 14 (1966); MPEP 2142. Obviousness is a legal question based on underlying factual determinations including: (1) the scope and content of the prior art, including what that prior art teaches explicitly and inherently; (2) the level of ordinary skill in the prior art; (3) the differences between the claimed invention and the prior art; and (4) objective evidence of nonobviousness. *Graham*, 383 U.S. at 17-18; *In re Dembiczak*, 175 F.3d 994, 998 (Fed. Cir. 1999).

“The key to supporting any rejection under 35 U.S.C. 103 is the clear articulation of the reason(s) why the claimed invention would have been obvious.” MPEP 2142 (2007). Analysis supporting a rejection under 35 U.S.C. §103(a) should be made explicit. *KSR Int’l Co. v. Teleflex, Inc.*, 82 USPQ2d 1385, 1396 (2007). Moreover, the Patent Office must identify a reason (such as motivation) why a person of ordinary skill in the art would have combined the prior art elements in the manner claimed. *Id.* “[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” *Id.* quoting *In re Kahn*, 441 F.3d 977, 988 (CA Fed. 2006); see also MPEP 2142.

It is the initial burden of the PTO to demonstrate a *prima facie* case of obviousness. If the PTO does not set forth a *prima facie* case of obviousness, the applicant is under no obligation to submit evidence of nonobviousness. MPEP 2142 (emphasis added).

1. Claims 14 and 19

Claims 14 and 19 have been canceled. Therefore, the rejection of claims 14 and 19 is moot.

2. Claims 15, 16, and 21-28

Claims 15, 16, and 21-28 depend from claim 11. If an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious. *In re Fine*, 837 F.2d

1071 (Fed. Cir. 1988). Therefore, the Applicant respectfully requests that the rejection of claims 15 and 16 be withdrawn for at least the same reasons as claim 14.

Moreover, with regard to the rejection of claims 15, 16, and 21-28 the Examiner submits one of two arguments as rationale for combining the references. More specifically, the Examiner argues that the combination would be obvious as one of multiple design choices as a first rationale (see rejection of claims 15, 16, 20, 22-24, and 26-28), or the Examiner argues that the combination of references is obvious in order to further filter a return signal (see the rejection of claims 19, 21, 25). However, the Examiner has failed to set forth a source of such rationale. Therefore, the Applicant respectfully requests that the rejection of claims 15, 16, and 21-28 be withdrawn for this reason as well.

If the origin of the rationales set forth for the proposed combinations exists in the references then the Applicants request that this origin be set forth by the Patent Office as suggested by MPEP 2144.08 III which states, “[w]here applicable, the finding should clearly articulate which portions of the reference support any rejection. Explicit findings on motivation or suggestion to select the claimed invention should also be articulated in order to support a 35 U.S.C. 103 ground of rejection. Dillon, 919 F.2d at 693, 16 USPQ2d at 1901; In re Mills, 916 F.2d 680, 683, 16 USPQ2d 1430, 1433 (Fed. Cir. 1990). Conclusory statements of similarity, or motivation, without any articulated rationale or evidentiary support, do not constitute sufficient factual findings.”

If, however, the Examiner is relying on the personal knowledge of the Examiner, pursuant to 37 C.F.R. 1.104(d)(2), Applicant hereby respectfully requests an Examiner affidavit that: (i) specifically identifies any and all references(s), other than those that have been specifically cited by the Examiner, upon which the obviousness rejection of claims 15, 16, and 21-28 is based; and (ii) provides complete details concerning the reasoning and analysis of the Examiner concerning those references as those references are purported to apply to the rejection of claims 15, 16, and 21-28. Such elements of claims 15, 16, and 21-28 are not merely design choices, but enable the particular advantages disclosed by the Applicant.

3. Claim 20

Claim 20 has been amended to place claim 20 in independent format. Claim 20 includes the elements, “a first spectral filter component including at least one spatial filter component, the

spatial filter component being formed and arranged in such a way that the angular range of reception of the reflected radiation is limited, wherein the at least one spatial filter component includes a fibre laser having a multimodal sheath and an active fibre core, and a second spectral filter component located upstream of the first spectral filter component in the receiving direction, wherein the second spectral filter component includes a UV filter." (Emphasis added).

The Examiner argues on page 4 of the Office Action that "it would have been obvious...to include the second spectral filter component including a UV filter because it is one of multiple design choices with no new or unexpected result." The Applicant respectfully traverses this assertion. As discussed in the Applicant's specification the claimed invention sets forth an arrangement of different filter components that are not arbitrary setups but specific combinations of elements which are designed for maximum reflection of high intensity radiation while keeping a detectable amount of radiation for measuring purposes.

As discussed on page two of the specification, these setups have been designed and may be a prerequisite for some applications, such as satellites which scan a topography of a celestial body with LIDAR from a circumpolar orbit. Such a satellite should, in principle, be capable of handling the different boundary conditions of the day and night side of a planet. The day side gives an extreme proportion of background radiation from which the LIDAR signal to be used has to be obtained.

Therefore, the multi-stage filter concept set forth in claim 20, for example, provides explicit advantages over the prior art which are not trivial and offer new and unexpected results. For example, in the drawings, which form part of the disclosure, the UV filter component 1 includes a dielectric multi-layer coating on a side of the instrument aperture which faces the outside. The filter component can, for example, be mounted as a layer on a ZnSe plate in the aperture, where wavelengths below 600 nm are reflected without absorption but longer wavelengths are transmitted without absorption according to this example.

The IR filter component 4 is located downstream of the UV filter component and has a gold mirror which does not absorb for this wavelength band.

The spatial filter component 6' is provided by direct or indirect focusing of the radiation onto the sensor used for reception, where the sensor surface acts as a field stop. The gold layer of the IR filter component can then be arranged in or close to the focal plane of the lens so that, in cooperation, any radiation incident outside the nadir direction is reflected. As a significant

part of the radiation is in the IR range, one of the main features which cause the unexpected results are the arrangement of the IR and spatial filters.

Moreover, the spectrally narrowband filter component 7 is selected to be particularly compact, for example in the form of a Fabry-Perot interferometer or fibre grating, having a band of $< 1\text{nm}$ about the LIDAR wavelength, so that any radiation outside this range is suppressed in the nadir direction.

By the multi-stage selection of the incident radiation, the useful radiation of the LIDAR system can be separated from the background radiation, heating of the arrangement being avoided by reflection. Particularly in the case of satellites, this “thermal load” is often a critical parameter which has to be minimized since the necessary cooling power has to be taken from the energy supply present as shown in Figure 3 reproduced below.

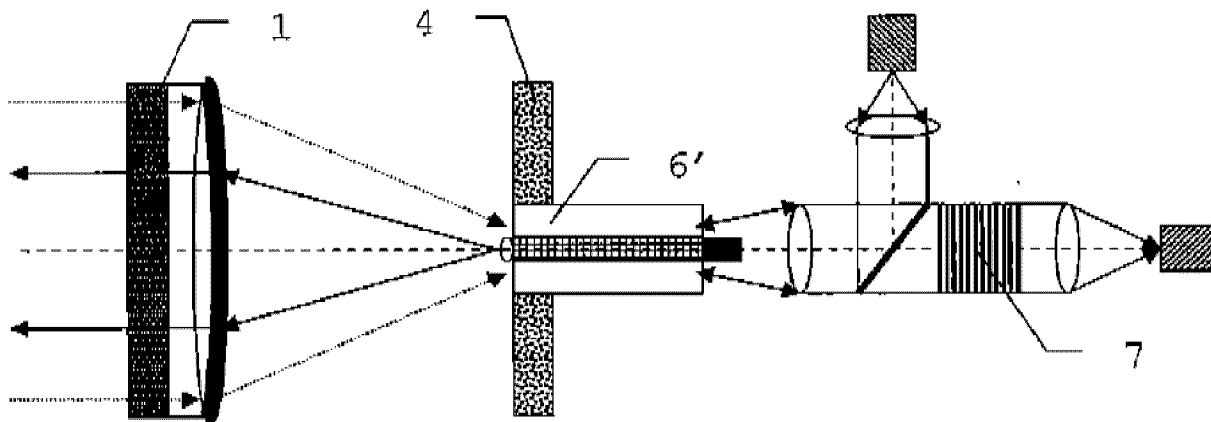


Fig. 3

As can be appreciated from the embodiment disclosed in Figure 3, the setup synergistically fulfills at least two different and contradicting purposes:

- shielding and reflecting radiation in order to reduce thermal load, and
- transmitting radiation in order to allow precise measurements.

The optical filters disclosed in *Morley*, for example, are bandpass filters, that is the filter allows a small and limited part of the spectrum to pass. In *Morley*, the other parts of the spectrum are blocked, as discussed in column 12, lines 42-59:

The optical filters 124a/b are each of a band-pass type, and each transmits light substantially at a different wavelength while filtering out light on each side of the notch band-pass. For example, one filter 124a may transmit light substantially at

790 nm, while the other transmits light substantially at 820 nm. These wavelengths are simply exemplary and are not specific nor limiting of the invention. One or the other of these spectral filters will be used during daytime operation of the device 10 for observation or laser range finding operations, dependent upon the ambient temperature conditions. During day-time observation and laser range finding operations, use of the optical filters 124a or 124b filters out other adjacent wavelengths of infrared light which may be rich in the day-time scene, and thus improves the signal to noise ratio for the image intensifier tube 50 in its mode of operation as a sensor for laser range finder operations and for imaging using light provided by the laser diode 92.

(Emphasis added).

In direct contrast, the spectrally broad filters of claim 11, such as a gold filter, are not specifically limited in their transmission – unlike a bandpass or notch-filter – but are designed to reflect the infrared radiation almost totally. This is discussed in the specification on page 7, lines 17-24:

By means of this arrangement, the infrared component IR of the radiation is also transmitted but, after passing through an IR filter component 4 as a first spectral filter component, is reflected back so that, after passing again through the ZnSe plate 2 and the UV filter component 1, the IR component IR leaves the distance metre again.

(Emphasis added).

Furthermore, claim 20, for example, includes the element, “a first spectral filter component including at least one spatial filter component, the spatial filter component being formed and arranged in such a way that the angular range of reception of the reflected radiation is limited”. (Emphasis added). However, the setup of *Morley*, for example, uses filter components that can be moved into the light path as discussed in column 12, lines 31 – 42:

The actuator 120 moves a spatial filter 122 into the light path (i.e., the path for light 28a(ir)) between prism 66 and image intensifier tube 50. This spatial filter is essentially an opaque blocking plate or shutter which defines a central aperture allowing reflected laser light to be returned to the image intensifier tube from a selected central portion of the scene 16. Also, dependent upon the position of lever 48, one or the other of at least two different optical band-pass filters 124a/124b may have been manually moved into the light path between prism 66 and image intensifier tube 50, viewing FIGS. 2.

In contrast thereto, several claimed embodiments are used without any moving components and have to be able to withstand day and night side conditions of planets. *Morley*, for example, deals with improving the signal-to-noise ratio and the measuring process. However, neither *Falk* nor *Morley* discuss the problem of thermal load or the limitations of airborne/spaceborne systems. Therefore, there is no reasonably predictable reason to include a spectral filter device into the setup of *Falk*.

V. NEW CLAIMS

Claims 29 and 30 have been added and depend from claims 20. Therefore, claims 29 and 30 are believed to be allowable at least for the same reasons as claim 20.

CONCLUSION

In view of the foregoing, Applicants believe the claims as amended are in allowable form. In the event that the Examiner finds remaining impediment to a prompt allowance of this application that may be clarified through a telephone interview, or which may be overcome by an Examiner's Amendment, the Examiner is requested to contact the undersigned attorney.

Dated this 14th day of November, 2007.

Respectfully submitted,

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